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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MALEVIC, DJURA	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 12/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/730,552	GILCHRIST ET AL.	
	Examiner	Art Unit	
	Djura Malevic	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/06/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5, and 7-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 8-16, 18-25 and 27-34* is/are rejected.

7)☒ Claim(s) *7,17 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06/10/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/05/05,3/29/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> *(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

Claims 1 –5, 8 – 16, 18 – 25, 27 - 30 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Tiller *et al.* (US Pub. 20030138067 A1).

With regards to claim 1, Tiller discloses a method for estimating a parameter of interest of an earth formation with a tool **20** having a nuclear radiation source **42** and a nuclear radiation detector **34** spaced apart from said nuclear radiation source **42** (Figure 2, and Figure 3b) comprising the steps of:

a) Activating the nuclear radiation source [0040].

b) Defining a start time t_2, for a processing time window **52** at which the detection is responsive to parameter of interest [0041].

c) Defining an end time t_3 for the processing time window **52** at which the detection is substantially uncontaminated by noise [0041].

d) Analyzing said measurements within the processing time window **52** for estimating the parameter of interest [0041].

With regards to claim 2, Tiller discloses a natural logarithm of gamma radiation intensity measure from an earlier operation as a function of time (t_2,t_3) thus, including defining said start time further comprises determining a time (t_2,t_3) at which a value of said measurements has predetermined relationship to the parameter of interest at an ending time of a processing time window **52** [0041] (Figure 3b).

With regards to claim 3, Tiller discloses a pulsed neutron source [0038].

With regards to claim 4, Tiller discloses measurements made by the nuclear radiation detector comprising gamma ray measurements [0041].

With regards to claim 5, Tiller discloses the parameter of interest further comprising thermal neutron capture cross section of the earth formation [0041].

With regards to claim 8, Tiller discloses defining said time window ending time comprises a running sum of count rates (C_1,C_2,C_3,C_4) starting at said starting time [0021,0041,0050].

With regards to claim 9, Tiller discloses the time window ending time comprises determining a time at which a count rate has a predetermined relation to said running sum [0021,0041,0050].

With regards to claim 10, Tiller discloses partitioning said window **52** into a plurality of channels (**62**, **64**) having a length depending upon said start time (Figure 3b).

With regards to claim 11, Tiller discloses an apparatus for use within a borehole penetrating an earth formation estimating a parameter of the earth formation comprising:

a) A nuclear radiation source irradiating the earth formation [0040].

b) A nuclear radiation detector spaced apart from said nuclear radiation source (Figure 2).

c) Electronics and computer means which includes a processor that defines a starting time for a processing time window at which measurements are made on the parameter of interest and the said processor defines an ending time which the measurements made are substantially uncontaminated by noise [0035, 0038, 0041,0050].

With regards to claim 12,Tiller discloses electronics including a processor defining a start time and an end time of a time window for operation of said source [0038 –0041].

With regards to claim 13, Tiller discloses electronics including a processor further analyzes said measurements within said processing time window **52** and said electronics determines said parameter of interest [0035,0041].

With regards to claim 14, Tiller discloses that the nuclear radiation source further comprises a pulsed neutron source [0038].

With regards to claim 15, Tiller discloses the measurements made by the detector comprise gamma ray measurements [0041].

With regards to claim 16, Tiller discloses the parameter of interest further comprising thermal neutron capture cross section of the earth formation [0041].

With regards to claim 18, Tiller discloses defining said time window ending time comprises a running sum of count rates starting at said staring time [0021,0041,0050].

With regards to claim 19, Tiller discloses time window ending time comprising determining a time at which a count rate has a predetermined relation to said running sum [0050].

With regards to claim 20, Tiller discloses defining said ending time based on determining a time at which a count rate has a predetermine relation to said running sum [0050].

With regards to claim 21, Tiller discloses a system for estimating a parameter of interest from an earth formation comprising:

a) A tool **20** including a nuclear radiation source **13** and a nuclear radiation detector **34** spaced apart from said radiation source **13**.

b) A tool comprising electronics including a processing unit defining a start time and end time of a time window of analysis of measurements where the measurements are responsive primarily to said parameter of interest of said starting time and substantially uncontaminated by noise at said ending time noise [0035, 0038, 0041,0050].

With regards to claim 22,Tiller discloses the parameter of interest from a predetermined time window having a start time and an end time from an earlier operation of said source [0021,0041,0050]

With regards to claim 23, Tiller discloses a pulsed neutron source [0038].

With regards to claim 24, Tiller discloses measurements made by the nuclear radiation detector comprising gamma ray measurements [0041].

With regards to claim 25, Tiller discloses the parameter of interest further comprising thermal neutron capture cross section of the earth formation [0041].

With regards to claim 27, Tiller discloses defining said time window ending time comprises a running sum of count rates starting at said staring time [0021,0041,0050].

With regards to claim 28, Tiller discloses defining said ending time based on determining a time at which a count rate has a predetermine relation to said running sum [0021,0041,0050].

With regards to claims 29 and 30, Tiller discloses the tool is conveyed along the borehole by means of a wire line [0018].

With regards to claim 32, Tiller discloses a computer that comprises a mass storage unit associated with the processor [0035].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

Claims 31 and 33- 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiller in view of Randall (US Patent 4,645,926).

With regards to claims 31 and 33, Tiller discloses the system for estimating a parameter of interest from an earth formation as claimed in claim 21, Tiller further discloses transforming radiation energy and intensity into parameter of interest using

methods well known in the art. However, Tiller does not expressly disclose the system including a channel number generator and a spectrum accumulator. Randall teaches a multi-channel scale (MCS) which includes a channel number generator and a spectrum accumulator. Tiller and Randall are analogous art because they both are from the same field of endeavor, method for measuring radiation in a borehole.

It would have been obvious at the time the invention was made to a person of ordinary skill in the art to modify Tiller to include multi-channel scale (MCS) which includes a channel number generator and a spectrum accumulator such as that taught by Randall in order to accumulate spectral data in the spectrum accumulator by using a channel number generated by the channel generator (Col. 6, Line 44).

With regards to claim 34, Tiller discloses the system for estimating a parameter of interest from an earth formation as claimed in claim 30 but does not expressly disclose the system including a depth controller. Randall teaches a depth controller. Tiller and Randall are analogous art because they both are from the same field of endeavor, method for measuring radiation in a borehole.

It would have been obvious at the time the invention was made to a person of ordinary skill in the art to modify Tiller to include a depth controller such as that taught by Randall in order to indicate movement of the tool within the well (Col. 7, Line 5).

Allowable Subject Matter

Claims 7, 17 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 7, 17 and 26 addresses said relationship between the parameter of interest at start and end time of the processing window wherein, the relationship is $Istr = K/\Sigma$ where *istr* is the start time of the window, K is a constant and Σ is the capture cross section at ending time of said time window from an earlier pulsing of the radiation source. The prior art of record is silent with regards to this relationship ($Istr = K/\Sigma$). As such, applicant's discloser provides a novel and nonobvious improvement over the prior art of record. Accordingly, claims 7, 17 and 26 have allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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